

AQA GCSE Geography Knowledge Organiser



- **Paper 1 – Living with the physical environment**
- 1 hour 30 minutes
- This exam is worth 35% of your GCSE

Section A: The challenge of natural hazards

Section B: The living world

Section C: Physical landscapes in the UK

The structure of the Earth

 The Crust	Varies in thickness (5-10km) beneath the ocean. Made up of several large plates.
The Mantle	Widest layer (2900km thick). The heat and pressure means the rock is in a liquid state that is in a state of convection.
The Inner and outer Core	Hottest section (5000 degrees). Mostly made of iron and nickel and is 4x denser than the crust. Inner section is solid whereas outer layer is liquid.

Convection Currents

The crust is divided into tectonic plates which are moving due to convection currents in the mantle.

- 1 Radioactive decay of some of the elements in the core and mantle generate a lot of heat.
- 2 When lower parts of the mantle molten rock (Magma) heat up they become **less dense** and **slowly rise**.
- 3 As they move towards the top they cool down, become **more dense** and **slowly sink**.
- 4 These **circular movements** of semi-molten rock are **convection currents**
- 5 Convection currents create **drag** on the base of the tectonic plates and this causes them to move.

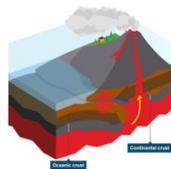
Slab pull theory

- 1 Slab pull occurs where older, denser tectonic plates sink into the mantle at subduction zones.
- 2 As these older sections of plates sink, newer and less dense sections of plate are pulled along behind.
- 3 Sinking in one place leads to plates moving apart in other places.

Types of Plate Margins

Destructive Plate Margin

When the denser plate subducts beneath the other, friction causes it to **melt and become molten magma**. The magma forces its way up to the surface to form a volcano. This margin is also responsible for **devastating earthquakes**.



Constructive Plate Margin

Here two plates are **moving apart** causing new magma to reach the surface through the gap. Volcanoes formed along this crack cause a submarine mountain range such as those in the **Mid Atlantic Ridge**.



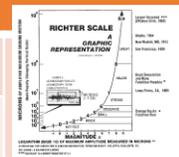
Conservative Plate Margin

A conservative plate boundary occurs where plates **slide past each other** in opposite directions, or in the same direction but at different speeds. This is responsible for earthquakes such as the ones happening along the San Andreas Fault, USA.



Earthquakes

Magnitude	Is the size / strength of an earthquake and is recorded on a seismograph .
Richter scale	Measures the magnitude of an earthquake and allows for comparisons to be made



Case study: Haiti Earthquake 2010 (UC)



Causes
On a conservative plate margin, involving the Caribbean & North American plates. The **magnitude 7.0 earthquake** was only **16km** from the capital Port au Prince. With a very **shallow focus of 5 miles deep**.

Primary effects <ul style="list-style-type: none"> • 250,000 people died and 3 million affected. • Many emotionally affected. • 250,000 homes collapsed or were damaged. 1.3 million were made homeless. Secondary effects <ul style="list-style-type: none"> • 1 in 5 people (20%) lost their jobs because so many buildings were destroyed • The large number of bodies left lining the streets meant that diseases like cholera became a serious problem. 	Immediate responses <ul style="list-style-type: none"> • USA sent 10,000 troops. • Bottled water and purification tablets were provided. • Heavily relied on international aid, e.g. £20 million from UK government. Long term responses <ul style="list-style-type: none"> • After 1 year re-building had begun. • Cash for work programmes were set up – paying Haitian people to rebuild and clear away rubble. • 1 year after earthquake over 1 million people were still living in temporary camps.
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Unit 1a The Challenges of Natural Hazards



What is a Natural Hazard?

A natural hazard is a natural process which could cause death, injury or disruption to humans, property and possessions.

Geological Hazard	Meteorological Hazard
These are hazards caused by land and tectonic processes.	These are hazards caused by weather and climate.

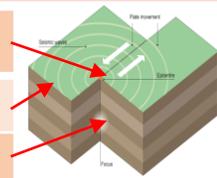
Causes of Earthquakes

Earthquakes are caused when two plates become **locked** causing **friction** to build up. From this **stress**, the **pressure** will eventually be released, triggering the plates to move into a new position. This movement causes energy in the form of **seismic waves**, to travel from the **focus** towards the **epicentre**. As a result, the crust vibrates triggering an earthquake.

The point directly above the focus, where the seismic waves reach first, is called the **EPICENTRE**.

SEISMIC WAVES (energy waves) travel out from the focus.

The point at which pressure is released is called the **FOCUS**.



Why do people live in hazardous prone areas?

Earthquakes and volcanic eruptions don't happen very often. They are not seen as a great threat in most people's lives.	Better building design can withstand earthquakes so people feel less at risk.
More effective monitoring of volcanoes and tsunami waves enable people to receive warnings and evacuate before events happen.	Fault lines associated with earthquakes can allow water supplies to reach the surface. This is particularly important in dry desert regions.
Volcanoes can bring benefits such as fertile soils, rocks for building, rich mineral deposits and hot water.	Some people may not be aware of the risk of living close to a plate margin.

Earthquake Management

PREDICTING Methods include: <ul style="list-style-type: none"> • Satellite surveying (tracks changes in the earth's surface) • Radon gas sensor (radon gas is released when plates move so this finds that) • Seismometer • Water table level (water levels fluctuate before an earthquake). • Scientists also use seismic records to predict when the next event will occur. 	
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PROTECTION You can't stop earthquakes , so earthquake-prone regions follow these three methods to reduce potential damage: <ul style="list-style-type: none"> • Building earthquake-resistant buildings • Raising public awareness • Improving earthquake prediction 	
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Case study: Japanese tsunami, 2011 (HIC)

Causes
Japan sits just above a destructive plate margin. Japan is located where the Pacific plate meets the Eurasian Plate. The Pacific plate (which is an oceanic plate) sinks under the Eurasian Plate (which is a continental plate.). This caused a magnitude 9 earthquake, under the sea leading to a tsunami.

Primary effects <ul style="list-style-type: none"> • Violet ground shaking for 5 minutes • 10m tsunami waves overtopping the flood defences. • Almost 18,000 deaths and 500,000 homeless Secondary effects <ul style="list-style-type: none"> • It was the costliest natural disaster ever (US\$235bn). • 100,000 people had to be evacuated from their homes due to fears of radiation leaking from Fukushima nuclear power plant. • Thousands of schools, offices and businesses were so badly damaged they didn't re-open for a year after the disaster. 	Immediate responses <ul style="list-style-type: none"> • Japan had 60 seconds warning time before the quake struck. This meant text messages could be sent to people in Japan. • 500,000 people were evacuated to higher ground. • 100,000 search and rescue workers were sent from within Japan Long term responses <ul style="list-style-type: none"> • After the event new tsunami walls were constructed up to 12.5m • March 2013 Japan revealed its new high-tech tsunami warning system.
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Global pattern of air circulation

Atmospheric circulation is the large-scale movement of air by which heat is distributed on the surface of the Earth.

Hadley cell Largest cell which extends from the Equator to between 30° to 40° north & south.

Ferrel cell Middle cell where air flows poleward between 60° & 70° latitude.

Polar cell Smallest & weakest cell that occurs from the poles to the Ferrel cell.



Distribution of Tropical Storms.

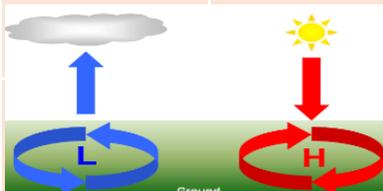
They are known by many names, including hurricanes (North America), cyclones (India) and typhoons (Japan and East Asia). They all occur in a band that lies roughly 5-15° either side of the Equator.



High and Low Pressure

Low Pressure

Caused by hot air rising. Causes stormy, cloudy weather.



High Pressure

Caused by cold air sinking. Causes clear and calm weather.

Formation of Tropical Storms

- The sun's rays heats large areas of ocean in the summer and autumn. This causes warm, moist air to rise over the particular spots
- Once the temperature is 27°, the rising warm moist air leads to a low pressure. This eventually turns into a thunderstorm. This causes air to be sucked in from the trade winds.
- With trade winds blowing in the opposite direction and the rotation of earth involved (Coriolis effect), the thunderstorm will eventually start to spin.
- When the storm begins to spin faster than 74mph, a tropical storm (such as a hurricane) is officially born.
- With the tropical storm growing in power, more cool air sinks in the centre of the storm, creating calm, clear condition called the eye of the storm.
- When the tropical storm hits land, it loses its energy source (the warm ocean) and it begins to lose strength. Eventually it will 'blow itself out'.

Changing pattern of Tropical Storms

Scientists believe that global warming is having an impact on the frequency and strength of tropical storms. This may be due to an increase in ocean temperatures.

Management of Tropical Storms

Protection

Preparing for a tropical storm may involve construction projects that will improve protection.

Development

The scale of the impacts depends on the whether the country has the resources cope with the storm.

Prediction

Constant monitoring can help to give advanced warning of a tropical storm

Aid

Aid involves assisting after the storm, commonly in LICs.

Planning

Involves getting people and the emergency services ready to deal with the impacts.

Education

Teaching people about what to do in a tropical storm.



Primary Effects of Tropical Storms

- The intense winds of tropical storms can destroy whole communities, buildings and communication networks.
- As well as their own destructive energy, the winds can generate abnormally high waves called storm surges.
- Sometimes the most destructive elements of a storm are these subsequent high seas and flooding they cause to coastal areas.

Secondary Effects of Tropical Storms

- People are left homeless, which can cause distress, poverty and ill health due to lack of shelter.
- Shortage of clean water and lack of proper sanitation makes it easier for diseases to spread.
- Businesses are damaged or destroyed causing employment.
- Shortage of food as crops are damaged.

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Case Study: Typhoon Haiyan 2013

Causes

Started as a tropical depression on 2nd November 2013 and gained strength. Became a Category 5 (wind speeds over 170mph) "super typhoon" and made landfall on the Pacific islands of the Philippines, with waves as high as 15m.

Primary effects

- More than 7,000 deaths.
- Over 600 000 people displaced and 1.9m were homeless.
- 90% of Tacloban city destroyed

Secondary effects

- 30,000 fishing boats were destroyed and 6 million people lost their source of income
- Major rice, corn and sugar-producing areas were destroyed

Immediate responses

- 750,000 people were evacuated.
- USA & UK sent helicopter carrier ships deliver aid remote areas.

Long term responses

- Education on typhoon preparedness.
- Cash for work programmes – people paid to help clear and rebuild city
- Thousands of homes built away from areas at risk from flooding

Case Study: UK Storm Babet 2023



Causes

Storm Babet occurred on 20th October 2023 and there was two months of rain in two days. Warm sea surface temperatures in the North Atlantic provided energy for the storm. The rain came on top of very wet weather earlier in October meaning the ground was already saturated.

Effect

- 7 people died
- 1200 homes were flooded
- 100,000 people were without power
- Rail services experienced delays or cancellations

Management

- Environment Agency issued 300,000 text message warnings
- Sand bags were distributed
- Government provided financial support for people affected
- 2023 EA spent £275,000 on natural flood management at Grassmoor Country Park – semi-permanent pond to

What is Climate Change? The long term change in the pattern of weather conditions on Earth

Recent Evidence for climate change.

Global temperature

Average global temperatures have increased by more than 0.6°C since 1950.

Ice sheets & glaciers

Many of the world's glaciers and ice sheets are melting. E.g. the Arctic sea ice has declined by 10% in 30 years.

Sea Level Change

Average global sea level has risen by 10-20cms in the past 100 years. This is due to the additional water from ice and thermal expansion.

Evidence of natural causes of climate change

Orbital Changes

Some argue that climate change is linked to how the Earth orbits the Sun, and the way it wobbles and tilts as it does it.

Sun Spots

Dark spots on the Sun are called Sun spots. They increase the amount of energy Earth receives from the Sun.

Volcanic Eruptions

Volcanoes release large amounts of dust containing gases. These can block sunlight and results in cooler temperatures.

Enhanced Greenhouse Effect

Recently there has been an increase in humans burning fossil fuels for energy. These fuels (gas, coal and oil) emit greenhouse gases. This is making the Earth's atmosphere thicker, therefore trapping more solar radiation and causing less to be reflected. As a result, the Earth is becoming warmer.

Managing Climate Change

Mitigation: action taken to reduce the long term risk from climate change
Adaptation: actions taken to adjust to natural events to reduce damage

Mitigation: Carbon Capture

This involves new technology designed to reduce climate change by capturing the carbon and storing it underground.

Adaptation: Reducing risk from sea level rises

Constructing sea walls, building houses that are raised off the ground and restoration of coastal mangroves to protect against coastal flooding.

Mitigation: Planting Trees

Planting trees increase the amount of carbon is absorbed from atmosphere.

Adaptation: Farming techniques

Introducing drought resistant crops and educating farmers in water harvesting (capture) techniques.

What is an Ecosystem?

An ecosystem is a system in which organisms interact with each other and with their environment.

Ecosystem's Components

Abiotic These are **non-living**, such as air, water, heat and rock.

Biotic These are **living**, such as plants, insects, and animals.

↳	Flora	Plant life occurring in a particular region or time.
	Fauna	Animal life of any particular region or time.



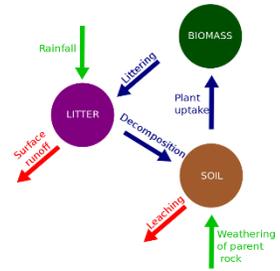
Food Web and Chains

Simple **food chains** are useful in explaining the basic principles behind ecosystems. They show only one species at a particular trophic level. **Food webs** however consists of a network of many food chains interconnected together.

Nutrient cycle

Plants take in **nutrients** to build into new organic matter. Nutrients are taken up when animals eat plants and then returned to the soil when animals die and their body is broken down by **decomposers**.

Producers	An organism that makes its own food by photosynthesis
Consumers	An animal that eats a plant or another animal
Decomposers	Feed on dead and decaying organisms, and on the undigested parts of plant and animal matter in faeces.
Litter	This is the surface layer of vegetation, which over time breaks down to become humus .
Biomass	The total mass of living organisms per unit area.



Biome's climate and plants

Biome	Location	Temperature	Rainfall	Flora	Fauna
Tropical rainforest	Centred along the Equator.	Hot all year (25-30°C)	Very high (over 200mm/year)	Tall trees forming a canopy; wide variety of species.	Greatest range of different animal species. Most live in canopy layer
Tropical grasslands	Between latitudes 5°- 30° north & south of Equator.	Warm all year (20-30°C)	Wet + dry season (500-1500mm/year)	Grasslands with widely spaced trees.	Large hooved herbivores and carnivores dominate.
Hot desert	Found along the tropics of Cancer and Capricorn.	Hot by day (over 30°C) Cold by night	Very low (below 300mm/year)	Lack of plants and few species; adapted to drought.	Many animals are small and nocturnal: except for the camel.
Temperate forest	Between latitudes 40°-60° north of Equator.	Warm summers + mild winters (5-20°C)	Variable rainfall (500-1500mm/year)	Mainly deciduous trees; a variety of species.	Animals adapt to colder and warmer climates. Some migrate.
Tundra	Far Latitudes of 65° north and south of Equator	Cold winter + cool summers (below 10°C)	Low rainfall (below 500mm/year)	Small plants grow close to the ground and only in summer.	Low number of species. Most animals found along coast.
Coral Reefs	Found within 30° north – south of Equator in tropical waters.	Warm water all year round with temperatures of 18°C	Wet + dry seasons. Rainfall varies greatly due to location.	Small range of plant life which includes algae and sea grasses that shelters reef animals.	Dominated by polyps and a diverse range of fish species.

Unit 1b Page 3



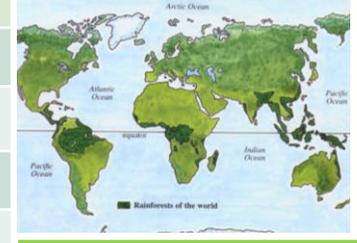
The Living World

Tropical Rainforest Biome

Tropical rainforests cover about **2 per cent** of the Earth's surface yet they are home to **over half of the world's plant and animals**.

Interdependence in the rainforest

A rainforest works through **interdependence**. This is where the plants and animals **depend on each other** for survival. If one component changes, there can be **serious knock-up effects** for the entire ecosystem.



Distribution of Tropical Rainforests

Tropical rainforests are **centred along the Equator** between the Tropic of Cancer and Capricorn. Rainforests can be found in South America, central Africa and South-East Asia. **The Amazon** is the world's largest rainforest and takes up the majority of northern South America, encompassing countries such as Brazil and Peru.

Rainforest nutrient cycle

The **hot, damp conditions** on the forest floor allow for the **rapid decomposition** of dead plant material. This provides plentiful nutrients that are easily absorbed by plant roots. However, as these nutrients are in high demand from the many fast-growing plants, they do not remain in the soil for long and stay close to the surface. If vegetation is removed, the soils quickly become **infertile**.

Climate of Tropical Rainforests

- Evening temperatures rarely fall below **22°C**.
- Due to the **presence of clouds**, temperatures rarely rise above **32°C**.
- Most afternoons have heavy showers.
- At night with no clouds insulating, temperature drops.

CASE STUDY: UK Ecosystem: Epping Forest, Essex



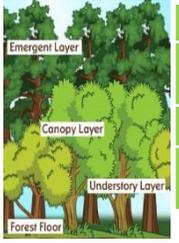
This is a typical English lowland deciduous woodland. **70% of the area** is designated as a **Site of Special Scientific Interest (SSI)** for its biological interest, with **66%** designated as a **Special Area of Conservation (SAC)**.

Components & Interrelationships	Management
Spring	Flowering plants (producers) such as bluebells store nutrients to be eaten by consumers later.
Summer	Broad tree leaves grow quickly to maximise photosynthesis .
Autumn	Trees shed leaves to conserve energy due to sunlight hours decreasing.
Winter	Bacteria decompose the leaf litter, releasing the nutrients into the soil.

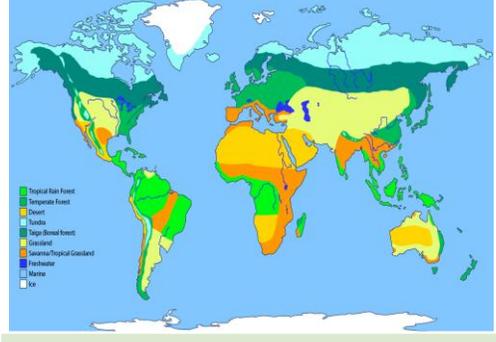
- Epping has been managed for centuries. - Currently now used for **recreation and conservation**.
- Visitors **pick fruit** and berries, helping to **disperse seeds**.
- Trees cut down to encourage **new growth for timber**.

Layers of the Rainforest

Emergent	Highest layer with trees reaching 50 metres .
Canopy	Most life is found here as it receives 70% of the sunlight and 80% of the life .
U-Canopy	Consists of trees that reach 20 metres high .
Shrub Layer	Lowest layer with small trees that have adapted to living in the shade .

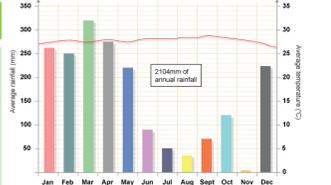


Large geographical area of distinctive plant and animal groups, which are adapted to that particular environment. The climate and geography of a region determines what type of biome can exist in that region.



	Coniferous forest
	Deciduous forest
	Tropical rainforests
	Tundra
	Temperate grasslands
	Tropical grasslands
	Hot deserts.

The **most productive biomes** – which have the greatest biomass- grow in climates that are **hot and wet**.



Tropical Rainforests: Case Study Malaysia



Malaysia is a LIC country in south-east Asia. 67% of Malaysia is a tropical rainforest with 18% of it not being interfered with. However, Malaysia has the fastest rate of deforestation compared to anywhere in the world.

Adaptations to the rainforest		Rainforest inhabitants
Orangutans	Large arms to swing & support in the tree canopy.	Many tribes have developed sustainable ways of survival. The rainforest provides inhabitants with... <ul style="list-style-type: none"> • Food through hunting and gathering. • Natural medicines from forest plants. • Homes and boats from forest wood.
Drip Tips	Allows heavy rain to run off leaves easily .	
Lianas & Vines	Climbs trees to reach sunlight at canopy.	

Issues related to biodiversity	What are the causes of deforestation?
Why are there high rates of biodiversity? <ul style="list-style-type: none"> • Warm and wet climate encourages a wide range of vegetation to grow. • There is rapid recycling of nutrients to speed plant growth. • Most of the rainforest is untouched. 	Logging <ul style="list-style-type: none"> • Most widely reported cause of destructions to biodiversity. • Timber is harvested to create commercial items such as furniture and paper. • Violent confrontation between indigenous tribes and logging companies.

Main issues with biodiversity decline	Agriculture	Mineral Extraction	Tourism
<ul style="list-style-type: none"> • Keystone species (a species that are important over other species) are extremely important in the rainforest ecosystem. Humans are threatening these vital components. • Decline in species could cause tribes being unable to survive. • Plants & animals may become extinct. • Key medical plants may become extinct. 	<ul style="list-style-type: none"> • Large scale 'slash and burn' of land for ranches and palm oil. • Increases carbon emission. • River saltation and soil erosion increasing due to the large areas of exposed land. • Increase in palm oil is making the soil infertile. 	<ul style="list-style-type: none"> • Precious metals are found in the rainforest. • Areas mined can experience soil and water contamination. • Indigenous people are becoming displaced from their land due to roads being built to transport products. 	<ul style="list-style-type: none"> • Mass tourism is resulting in the building of hotels in extremely vulnerable areas. • Lead to negative relationship between the government and indigenous tribes. • Tourism has exposed animals to human diseases.

Impacts of deforestation	Energy Development	Road Building
<ul style="list-style-type: none"> + Mining, farming and logging creates employment and tax income for government. + Products such as palm oil provide valuable income for countries. - The loss of biodiversity will reduce tourism. 	<ul style="list-style-type: none"> • The high rainfall creates ideal conditions for hydro-electric power (HEP). • The Bakun Dam in Malaysia is key for creating energy in this developing country, however, both people and environment have suffered. 	<ul style="list-style-type: none"> • Roads are needed to bring supplies and provide access to new mining areas, settlements and energy projects. • In Malaysia, logging companies use an extensive network of roads for heavy machinery and to transport wood.

Soil erosion	Sustainability for the Rainforest
<ul style="list-style-type: none"> - Once the land is exposed by deforestation, the soil is more vulnerable to rain. - With no roots to bind soil together, soil can easily wash away. 	Uncontrolled and unchecked exploitation can cause irreversible damage such as loss of biodiversity, soil erosion and climate change. <p>Possible strategies include:</p> <ul style="list-style-type: none"> • Agro-forestry - Growing trees and crops at the same time. It prevents soil erosion and the crops benefit from the nutrients. • Selective logging - Trees are only felled when they reach a particular height. • Education - Ensuring those people understand the consequences of deforestation • Afforestation - If trees are cut down, they are replaced. • Forest reserves - Areas protected from exploitation. • Ecotourism - tourism that promotes the environments & conservation

Climate Change
<ul style="list-style-type: none"> -When rainforests are cut down, the climate becomes drier. -Trees are carbon 'sinks'. With greater deforestation comes more greenhouse emissions in the atmosphere. -When trees are burnt, they release more carbon in the atmosphere. This will enhance the greenhouse effect.

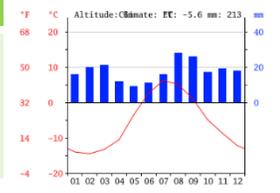
Cold Environment: Case Study Svalbard, Norway



Svalbard is a Norwegian territory in the Arctic Ocean and the most northerly inhabited group of islands in the world. Much of Svalbard is a polar climate with 60% of the land covered by glaciers.

Distribution of the world's cold environments	Major characteristics of cold environments
<p>Most of the world's cold environments are found in high latitude areas 60° north and south of the equator. There are some in high mountain regions too e.g. Himalayas.</p>	<ul style="list-style-type: none"> • There are two biomes in cold environments: polar and tundra • Polar: permanently covered by ice so soils are permanently frozen. Some plants such as mosses and lichens are found on the fringes of the ice. • Tundra: soils are frozen (permafrost) but in summer will melt closer to the surface. • Six months of daylight and 6 months of darkness.

Cold environments inhabitants	Climate of cold environments
<ul style="list-style-type: none"> • Low populations due to the extreme climate • Indigenous tribes in Arctic areas. 	<ul style="list-style-type: none"> • Polar climate – winter temperatures often fall below -50°C with low precipitation totals. • Tundra climate – climate is less extreme. Winter temperatures may drop to -20 °C. The brief summers can be quite warm. Amounts of snow can be high in coastal regions.



Adaptations to the cold environment	
Polar bear	<ul style="list-style-type: none"> • Large paws which make them strong for swimming • Small ears and tail to minimise heat loss. • Thick layer of fat under its fur to help it keep warm.
Bearberry	<ul style="list-style-type: none"> • Very low growing (5-15cm off the ground) to survive the strong winds • Small leathery leaves to retain water • Steams have thick bark for stability in windy conditions.

Opportunities and challenges in Cold Environments	
Opportunities	Challenges
<ul style="list-style-type: none"> • There are valuable minerals such as coal. • There is potential for geo thermal energy. • The cold waters of the Barents Sea south of Svalbard are one of the richest fishing grounds in the world. • Tourism in Svalbard has grown in recent years as people seek to explore extreme natural environments. 	<ul style="list-style-type: none"> • Temperatures reach as low as -30°C in Longyearbyen make it difficult to work outside. • The frozen ground (permafrost) can melt and if it does it becomes unstable leading to buildings and roads cracking or even collapsing. • Pipes need to be kept off the ground to prevent them causing any possible thawing of the permafrost. • The islands are inaccessible and almost all transport systems are restricted to the immediate area around Longyearbyen.

Cold environments under threat		Strategies to reduce the risks to cold environments
Why are cold environments fragile?	Why do cold environments need to be protected?	<ul style="list-style-type: none"> • Conservation groups: Conservation groups such as the WWF and the Northern Alaskan environmental centre aim to conserve the Alaskan environment by proving scientific information, expertise and resources. • International agreements: allow standards to be set to ensure that economic development does not happen at the expense of the environment. • Technology: In 1974 the US government built a pipe line 1300km long to take oil from the north of Alaska to the port of Valdez in the south of Alaska. This pipeline was called the trans-Alaskan pipeline and is an example of how technology allows the economic development of the region. • Role of government: The US government has been involved in the protection of Alaska ever since oil was discovered there in the 1960s.
They can be easily damaged by human activities. Tundra can take a very long time to recover from any damage that is done by human activity.	Many indigenous people live a traditional life here. E.g. Inuit who live in Arctic Alaska depend on wildlife and survive by hunting and fishing.	
Rivers are at risk of becoming polluted by oil spills. There is a risk of fire either started deliberately or by a lightning strike.	Unpolluted and unspoiled cold environments are important outdoor laboratories for scientific research such as the effects of climate change.	

Relief of the UK

Relief of the UK can be divided into uplands and lowlands. Each have their own characteristics.

Key

Lowlands	
Uplands	



Areas +600m: Peaks and ridges cold, misty and snow common. i.e. Scotland

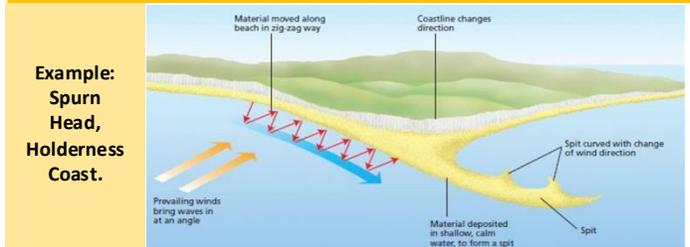
Areas - 200m: Flat or rolling hills. Warmer weather. i.e. Fens

Types of Erosion	
The break down and transport of rocks – smooth, round and sorted.	
Attrition	Rocks that bash together to become smooth/smaller.
Solution	A chemical reaction that dissolves rocks.
Abrasion	Rocks hurled at the base of a cliff to break pieces apart.
Hydraulic Action	Water enters cracks in the cliff, air compresses, causing the crack to expand.

Types of Transportation	
A natural process by which eroded material is carried/transported.	
Solution	Minerals dissolve in water and are carried along.
Suspension	Sediment is carried along in the flow of the water.
Saltation	Pebbles that bounce along the sea/river bed.
Traction	Boulders that roll along a river/sea bed by the force of the flowing water.

Mass Movement	
A large movement of soil and rock debris that moves down slopes in response to the pull of gravity in a vertical direction.	
1	Rain saturates the permeable rock above the impermeable rock making it heavy.
2	Waves or a river will erode the base of the slope making it unstable.
3	Eventually the weight of the permeable rock above the impermeable rock weakens and collapses.
4	The debris at the base of the cliff is then removed and transported by waves or river.

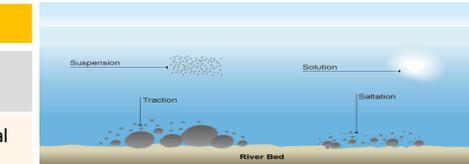
Formation of Coastal Spits - Deposition



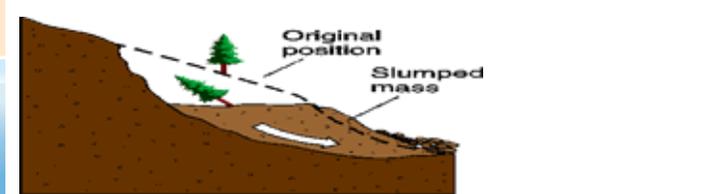
- 1) Swash moves up the beach at the angle of the prevailing wind.
- 2) Backwash moves down the beach at 90° to coastline, due to gravity.
- 3) Zigzag movement (Longshore Drift) transports material along beach.
- 4) Deposition causes beach to extend, until reaching a river estuary.
- 5) Change in prevailing wind direction forms a hook.
- 6) Sheltered area behind spit encourages deposition, salt marsh forms.

Types of Weathering

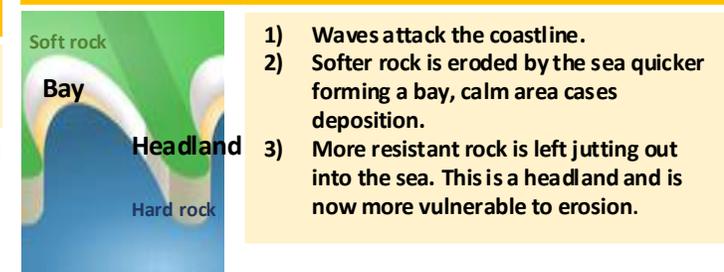
Weathering is the breakdown of rocks where they are.	
Carbonation	Breakdown of rock by changing its chemical composition.
Mechanical	Breakdown of rock without changing its chemical composition.



What is Deposition?
When the sea or river loses energy, it drops the sand, rock particles and pebbles it has been carrying. This is called deposition.



Formation of Bays and Headlands



Unit 1c Physical Landscapes in the UK

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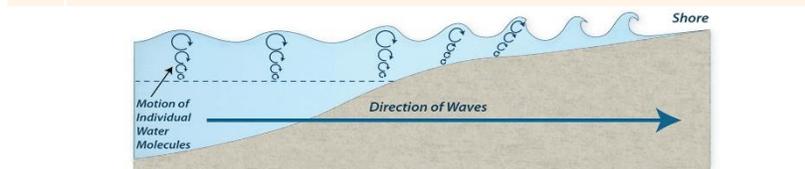


How do waves form?

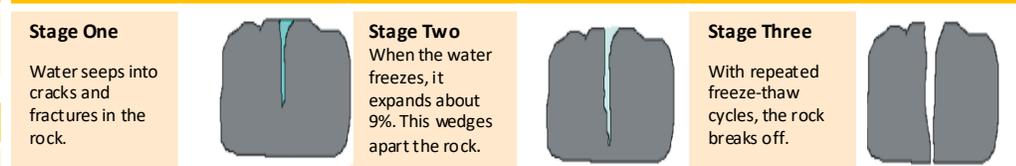
Waves are created by wind blowing over the surface of the sea. As the wind blows over the sea, friction is created - producing a swell in the water.

Why do waves break?

1	Waves start out at sea.
2	As waves approaches the shore, friction slows the base.
3	This causes the orbit to become elliptical.
4	Until the top of the wave breaks over.



Mechanical Weathering Example: Freeze-thaw weathering



Size of waves

Size of waves	Types of Waves	
<ul style="list-style-type: none"> • Fetch how far the wave has travelled • Strength of the wind. • How long the wind has been blowing for. 	Constructive Waves This wave has a swash that is stronger than the backwash. This therefore builds up the beach / coast.	Destructive Waves This wave has a backwash that is stronger than the swash. This therefore erodes the beach / coast.

Formation of Coastal Stack



- 1) Hydraulic action widens cracks in the cliff face over time.
- 2) Abrasion forms a wave cut notch between high tide and low tide.
- 3) Further abrasion widens the wave cut notch to form a cave.
- 4) Caves from both sides of the headland break through to form an arch.
- 5) Weathering from above and erosion from the sea causes the arch to collapse leaving a stack.
- 6) Further weathering and erosion leaves a stump.

Example: Old Harry Rocks, Dorset

Coastal Defences

Hard Engineering Defences

Groynes	Wood barriers prevent longshore drift, so the beach can build up.	<ul style="list-style-type: none"> ✓ Beach still accessible. ✗ No deposition further down coast = erodes faster.
Sea Walls	Concrete walls break up the energy of the wave. Has a lip to stop waves going over.	<ul style="list-style-type: none"> ✓ Long life span ✓ Protects from flooding ✗ Curved shape encourages erosion of beach deposits.
Gabions or Rip Rap	Cages of rocks/boulders absorb the waves energy, protecting the cliff behind.	<ul style="list-style-type: none"> ✓ Cheap ✓ Local material can be used to look less strange. ✗ Will need replacing.

Soft Engineering Defences

Beach Nourishment	Beaches built up with sand, so waves have to travel further before eroding cliffs.	<ul style="list-style-type: none"> ✓ Cheap ✓ Beach for tourists. ✗ Storms = need replacing. ✗ Offshore dredging damages seabed.
Managed Retreat	Low value areas of the coast are left to flood & erode.	<ul style="list-style-type: none"> ✓ Reduce flood risk ✓ Creates wildlife habitats. ✗ Compensation for land.

Example: Holderness Coast

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Location and Background
East coast of England, boarding the North Sea in the county of Yorkshire
Flamborough Head (chalk more resistant rock) Hornsea (boulder clay less resistant rock). Europe's fastest eroding coastline, eroding on average 1m per year.

Geomorphic Processes
- Features found at Flamborough Head a SSSI include stack, stump, caves (some of which are 50m long) and wave cut platforms. This is when a wave-cut notch develops enough for the cliff face to become unstable and eventually collapses.
-Longshore drift travels from Famborough in the north to Spurn Head another SSSI a spit in the south.

Management
-Hornsea is protected by a number of groynes. These trap sand to build up the beach for better protection.
-The town is also protected by large sea walls to prevent flooding and deflect the waves energy.

Water Cycle Key Terms

Precipitation	Moisture falling from clouds as rain, snow or hail.
Interception	Vegetation prevent water reaching the ground.
Surface Runoff	Water flowing over surface of the land into rivers
Infiltration	Water absorbed into the soil from the ground.
Transpiration	Water lost through leaves of plants.

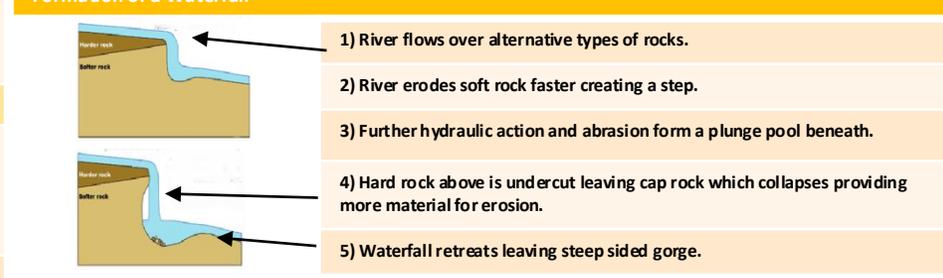
Physical and Human Causes of River Flooding.

Physical: Prolong & heavy rainfall Long periods of rain causes soil to become saturated leading runoff.	Physical: Geology Impermeable rocks causes surface runoff to increase river discharge.
Physical: Relief Steep-sided valleys channels water to flow quickly into rivers causing greater discharge.	Human: Land Use Tarmac and concrete are impermeable. This prevents infiltration & causes surface runoff.

Upper Course of a River

Near the source, the river flows over steep gradient from the hill/mountains. This gives the river a lot of energy, so it will erode the riverbed vertically to form narrow valleys.

Formation of a Waterfall

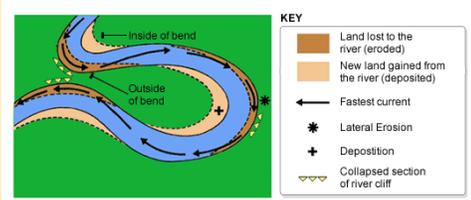


Middle Course of a River

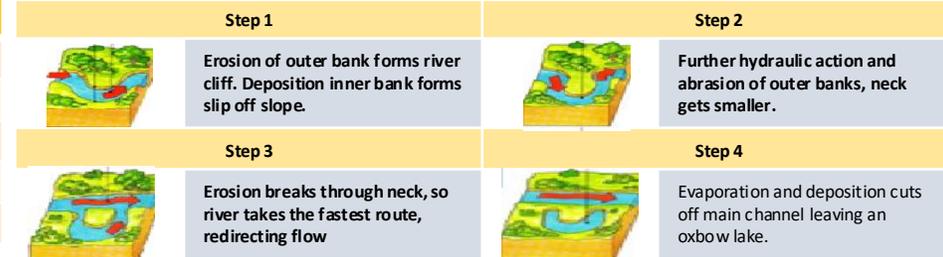
Here the gradient get gentler, so the water has less energy and moves more slowly. The river will begin to erode laterally making the river wider.

Meanders

One theory of meander formation is the swinging of a river to avoid riffles (shallow section). The water flows faster on the outside of the bend. As the water travels further here its speed and erosive capacity is greater. River cliffs and a deeper channel is produced on the outside of the bend. On the inside bend the water is shallower and slower. The slower, shallower water allows deposition. The deposits form a slip off slope. The corkscrew motion of water is called helicoidal flow.



Formation of Ox-bow Lakes

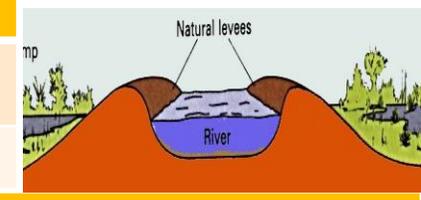


Lower Course of a River

Near the river's mouth, the river widens further and becomes flatter. Material transported is deposited.

Formation of Floodplains and levees

When a river floods, fine silt/alluvium is deposited on the valley floor. Closer to the river's banks, the heavier materials build up to form natural levees.



- ✓ Nutrient rich soil makes it ideal for farming.
- ✓ Flat land for building houses.

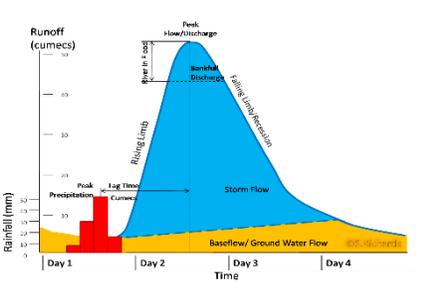
River Management Schemes

Soft Engineering	Hard Engineering
<p>Afforestation – plant trees to soak up rainwater, reduces flood risk.</p> <p>Demountable Flood Barriers put in place when warning raised.</p> <p>Managed Flooding – naturally let areas flood, protect settlements.</p>	<p>Straightening Channel – increases velocity to remove flood water.</p> <p>Artificial Levees – heightens river so flood water is contained.</p> <p>Deepening or widening river to increase capacity for a flood.</p>

Hydrographs and River Discharge

River discharge is the volume of water that flows in a river. Hydrographs who discharge at a certain point in a river changes over time in relation to rainfall

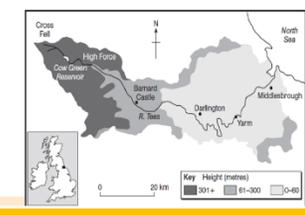
1. **Peak discharge** is the discharge in a period of time.
2. **Lag time** is the delay between peak rainfall and peak discharge.
3. **Rising limb** is the increase in river discharge.
4. **Falling limb** is the decrease in river discharge to normal level.



Example: The River Tees

Location and Background
Located in the North of England and flows 137km from the Pennines to the North Sea at Red Car.

Geomorphic Processes
Upper – Features include V-Shaped valley, rapids and waterfalls. Highforce Waterfall drops 21m and is made from harder Whinstone and softer limestone rocks. Gradually a gorge has been formed.
Middle – Features include meanders and ox-bow lakes. The meander near Yarm encloses the town.
Lower – Greater lateral erosion creates features such as floodplains & levees. Mudflats at the river's estuary.



Example: Sheffield flood management scheme

Strategy 1 – cleared blocked drains and removed debris in River Don
Strategy 2 – building concrete river walls next to the River Don to increase capacity
Strategy 3 – Using the land next to Lady Canning's plantation as a flood relief channel (upstream) to reduce the amount of water flowing down the river into the city centre

AQA GCSE Geography Knowledge Organisers

- **Paper 2 – Living with the human environment**
- 1 hour 30 minutes
- This exam is worth 35% of your GCSE

Section A: Urban issues and challenges

Section B: The changing economic world

Section C: The challenge of resources

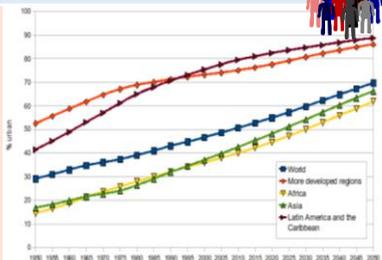
Updated January 2026

What is Urbanisation?

This is an increase in the amount of people living in urban areas such as towns or cities. In 2007, the UN announced that for the first time, more than 50 % of the world's population live in urban areas.

Where is Urbanisation happening?

Urbanisation is happening all over the world but in LICs and NEEs rates are much faster than HICs. This is mostly because of the rapid economic growth they are experiencing.



Causes of Urbanisation

Rural - urban migration (1)

The movement of people from rural to urban areas.



- Natural disasters
- War and conflict
- Mechanisation
 - Drought
- Lack of employment

Pull



- More Jobs
- Better education & healthcare
- Increased quality of life.
- Following family members.

Natural Increase (2)

When the birth rate exceeds the death rate.

Increase in birth rate (BR)

- High percentage of population are child-bearing age which leads to high fertility rate.
- Lack of contraception or education about family planning.

Lower death rate (DR)

- Higher life expectancy due to better living conditions and diet.
- Improved medical facilities helps lower infant mortality rate.

Types of Cities

Megacity

An urban area with over 10 million people living there.



More than two thirds of current megacities are located in either NEEs (Brazil) and LICs (Nigeria). The amount of megacities are predicted to increase from 28 to 41 by 2030.

Sustainable Urban Living

Sustainable urban living means being able to live in cities in ways that do not pollute the environment and using resources in ways that ensure future generations also can use them.

Water Conservation

This is about reducing the amount of water used.

- Collecting rainwater for gardens and flushing toilets.
- Installing water meters and toilets that flush less water.
- Educating people on using less water.

Energy Conservation

Using less fossil fuels can reduce the rate of climate change.

- Promoting renewable energy sources.
- Making homes more energy efficient.
- Encouraging people to use less energy.

Creating Green Space

Creating green spaces in urban areas can improve places for people who want to live there.

- Provide natural cooler areas for people to relax in.
- Encourages people to exercise.
- Reduces the risk of flooding from surface runoff.

Waste Recycling

More recycling means fewer resources are used. Less waste reduces the amount that eventually goes to landfill.

- Collection of household waste.
- More local recycling facilities.
- Greater awareness of the benefits in recycling.

Unit 2a



Urban Issues & Challenges

Sustainable Urban Living Example: Curitiba

Background & Location

Curitiba is located in SE Brazil and has a population of approximately 1.75 million. Curitiba has a planned transport system which is used by 85% of the population. Bi-articulated buses carry 4000 passengers per day. Dedicated bus lanes. The bus system is 500 times cheaper than an underground system.

Sustainable Strategies

Recycling and garbage scheme - separates waste and is processed so that it is reused again, this is cheaper than landfill. Green exchange - low income people exchange their waste for surplus fruit and vegetable that the country produces.

Integrated Transport System

This is the linking of different forms of public and private transport within a city and the surrounding area.

Brownfield Site

Brownfield sites are areas of land or premises that have previously been used, but has subsequently become vacant, derelict or contaminated.

Traffic Management

Urban areas are busy places with many people travelling by different modes of transport. This has caused urban areas to experience different traffic congestion that can lead to various problems.

Environmental problems

- Traffic increases air pollution which releases greenhouse gases that is leading to climate change.



Economic problems

- Congestion can make people late for work and business deliveries take longer. This can cause companies to lose money.

Social Problems

- There is a greater risk of accidents and congestion is a cause of frustration. Traffic can also lead to health issues for pedestrians.

Congestion Solutions

- Widen roads to allow more traffic to flow easily.
- Build ring roads and bypasses to keep through traffic out of city centres.
- Introduce park and ride schemes to reduce car use.
- Encourage car-sharing schemes in work places.
- Have public transport, cycle lanes & cycle hire schemes.
- Having congestion charges discourages drivers from entering the busy city centres.



Traffic Management Example: London

- Congestion charge was introduced in 2003
- Vehicles entering central areas of London between 7am and 6pm are charged a few.
- The aim is to reduce cars and encourage people to use public transport
- Cycle hire - 'Boris bike' were launched in 2010.
- The bikes cost £2 to hire and there are nearly 800 docking stations and around 14,000 bikes available to rent



Greenbelt Area

This is a zone of land surrounding a city where new building is strictly controlled to try to prevent cities growing too much and too fast.

Urban Regeneration

The investment in the revival of old, urban areas by either improving what is there or clearing it away and rebuilding.



Location and Background
<p>Sheffield is a city in South Yorkshire in the North of England. The population of the city is 575,000, making it the fifth largest in the UK. The city grew during the Industrial Revolution.</p> 

City's Importance
<p>National:</p> <ul style="list-style-type: none"> • Hosts music events like Tramlines Festival • Sheffield is centrally located and offers excellent transport links to cities like Manchester and Leeds. <p>International</p> <ul style="list-style-type: none"> • Hosts major international events like the World Snooker Championship • Sheffield is famous for being described as the greenest city in Europe. • Sheffield has two major UK universities and the University of Sheffield is a world top 100 university

Migration to Sheffield
<p>During the Industrial Revolution, the population dramatically increased with people migrating from nearby rural communities.</p> <p>With the attraction of working in the large steelworks or mines, international migrants from Ireland, Pakistan and the Caribbean came to work in Sheffield from 1900-1960.</p> <p>From 2004 onwards migrants have arrived from east Europe and refugees from Syria and Afghanistan. Sheffield has attracted thousands of students from the UK & abroad.</p> <p>In 2018 Sheffield saw a 12% rise of people moving from London to Sheffield.</p>

City's Opportunities
<p>Social: There is a vibrant music scene with concerts being held at places like the Utilita Arena and there are many sporting venues e.g. English Institute of Sport (EIS) and Ponds Forge. Inward migration has led to an increase in diversity in the city e.g. New Era Square. It attracts 50,000 students, including international students.</p> <p>Economic: 1 job in every 100 in the Sheffield City Region is supported through Meadowhall's activities. 600 highly skilled jobs have been created at the Advanced Manufacturing Research Centre.</p> <p>Environmental: Sheffield is described as being the greenest city in Europe. It's close to the Peak District and has various open spaces (i.e. the Peace Garden) for residents to enjoy. Clean Air Zone introduced in Feb 2023.</p>

City Challenges
<p>Social: Inequality means that there are huge differences in peoples' quality of life – Dore v Darnall. House prices have increased along with greater house shortages.</p> <p>Economic: Closure of the steelworks and factories caused large scale unemployment and derelict buildings. Sheffield city centre performs less well than other cities due to Meadowhall.</p> <p>Environmental: Urban sprawl has led to increased pressure and decline of greenfield sites around the city, this has caused pressure on the rural-urban fringe. Derelict buildings, waste disposal. Growth of commuter settlements.</p>

Sheffield regeneration: Meadowhall
<p>Brownfield site regenerated (former Hadfields Steel Industry) next to junction 34 of the M1</p> <ul style="list-style-type: none"> • 12000 free car parking spaces • 290 shops • Employs 8,500 people • 1 in 100 jobs in Sheffield is supported by Meadowhall <p>However, it has pulled business away from the Sheffield city centre leading to the regeneration of the Moor and Moor Market. Local people call it Meadowhell due to the increased traffic in the area.</p>

Location and Background
<p>Rio is a coastal city situated in the South East region of Brazil within the continent of South America. It is the second most populated city in the country (6.7 million) after Sao Paulo. 13.4 million including the surrounding area.</p> 

City's Importance
<p>Regional</p> <ul style="list-style-type: none"> • Has the second largest GDP in Brazil. • A port and airport which attracts internal migrants due to the job opportunities <p>National and international</p> <ul style="list-style-type: none"> • It is headquarters to many of Brazil's main companies, particularly with oil and gas. • Exports sugar and coffee around the world • Sugar Loaf Mountain is one of the seven wonders of the world. • Hosted the 2014 World Cup and 2016 Summer Olympics.

Migration to Rio De Janeiro
<p>The city began when Portuguese settlers with slaves arrived in 1502. Since then, Rio has become home to various ethnic groups.</p> <p>However, more recently, millions of people have migrated from rural areas that have suffered from drought, lack of services and unemployment to Rio. People do this to search for a better quality of life. It is mainly young people that migrate to the city.</p> <p>This expanding population has resulted in the rapid urbanisation of Rio de Janeiro.</p>

City's Opportunities
<p>Social: Standards of living are gradually improving. Life expectancy is at 76.3 years (higher than the rest of Brazil). There are 3 public hospitals. Rio has 1000 primary schools, 400 secondary schools ad 6 universities. 99% residents have access to energy/ electricity.</p> <p>Economic: Rio has one of the highest incomes per person in the country. The city has various types of employment including oil, retail and manufacturing. Major trading port. Petrobras (energy company) has its HQ here. Major centre for tourism e.g. Christ the Redeemer and Copacabana Beach</p> <p>Environmental: The hosting of the major sporting events (2016 Olympics) encouraged more investment in sewage works and public transport systems.</p>

City Challenges
<p>Social: The growth of favelas – 24% of residents live in these informal houses. There is less access to services and healthcare in favelas. 12% of the city do not have access to clean water. 25% of poorest children do not attend school.</p> <p>Economic: The rise of informal jobs (1 in 3 work in the informal economy) with low pay and no tax contributions. Unemployment rates in favelas is 37% and female unemployment rate is 18%.</p> <p>Environmental: Favelas are typically built on unfavourable land, such as hills. A landslide in 2010 killed 224 people. 35% of the city's sewage is dumped in Guanabara Bay. 5000 deaths per year caused by air pollution.</p>

Self-help schemes – Favela Bairro Project
<p>Background</p> <ul style="list-style-type: none"> • Improving the quality of life for 250,000 residents • Cost US\$1bn • Site and service scheme: The authorities have provided basic materials to improve peoples homes with safe electricity and sewage pipes. <p>Positives and negatives</p> <ul style="list-style-type: none"> ✓ Streets tidied up, football pitches built ✓ Training centres to improve adult literacy rates ✓ Residents can apply to own their own properties ✓ Paved and named roads to improves access to public services ✓ Cable car to improve access to city centre ✓ Community policing has been established • However, training for employment has had limited success and rents have risen in some areas

What is development?

Development is an improvement in living standards through better use of resources.

Economic	This is progress in economic growth through levels of industrialisation and use of technology.
Social	This is an improvement in people's standard of living. For example, clean water and electricity.
Environmental	This involves advances in the management and protection of the environment.

Measuring development

These are used to compare and understand a country's level of development.

Economic indicators examples

Employment type	The proportion of the population working in primary, secondary, tertiary and quaternary industries.
Gross Domestic Product per capita	This is the total value of goods and services produced in a country per person, per year.
Gross National Income per capita	An average of gross national income per person, per year in US dollars.

Social indicators examples

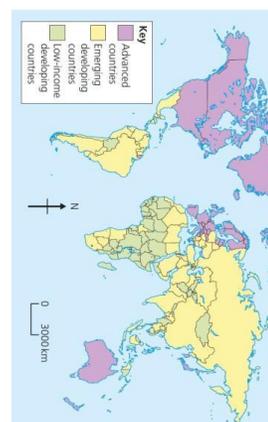
Infant mortality	The number of children who die before reaching 1 per 1000 babies born.
Literacy rate	The percentage of population over the age of 15 who can read and write.
Life expectancy	The average lifespan of someone born in that country.

Mixed indicators

Human Development Index (HDI)	A number that uses life expectancy, education level and income per person.
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Variations in the level of development

LICs	Poorest countries in the world. GNI per capita is low and most citizens have a low standard of living.
NEEs	These countries are getting richer as their economy is progressing from the primary industry to the secondary industry. Greater exports leads to better wages.
HICs	These countries are wealthy with a high GNI per capita and standards of living. These countries can spend money on services.



Causes of uneven development

Development is globally uneven with most HICs located in Europe, North America and Oceania. Most NEEs are in Asia and South America, whilst most LICs are in Africa. Remember, development can also vary within countries too.

Unit 2b



The Changing Economic World

Physical factors affecting uneven development

Natural Resources	Natural Hazards
<ul style="list-style-type: none"> Fuel sources such as oil. Minerals and metals for fuel. Availability for timber. Access to safe water. 	<ul style="list-style-type: none"> Risk of tectonic hazards. Benefits from volcanic material and floodwater. Frequent hazards undermines redevelopment.
Climate	Location/Terrain
<ul style="list-style-type: none"> Reliability of rainfall to benefit farming. Extreme climates limit industry and affects health. Climate can attract tourists. 	<ul style="list-style-type: none"> Landlocked countries may find trade difficulties. Mountainous terrain makes farming difficult. Scenery attracts tourists.

Human factors affecting uneven development

Aid	Trade
<ul style="list-style-type: none"> Aid can help some countries develop key projects for infrastructure faster. Aid can improve services such as schools, hospitals and roads. Too much reliance on aid might stop other trade links becoming established. 	<ul style="list-style-type: none"> Countries that export more than they import have a trade surplus. This can improve the national economy. Having good trade relationships. Trading goods and services is more profitable than raw materials.
Education	Health
<ul style="list-style-type: none"> Education creates a skilled workforce meaning more goods and services are produced. Educated people earn more money, meaning they also pay more taxes. This money can help develop the country in the future. 	<ul style="list-style-type: none"> Lack of clean water and poor healthcare means a large number of people suffer from diseases. People who are ill cannot work so there is little contribution to the economy. More money on healthcare means less spent on development.
Politics	History
<ul style="list-style-type: none"> Corruption in local and national governments. The stability of the government can effect the country's ability to trade. Ability of the country to invest into services and infrastructure. 	<ul style="list-style-type: none"> Colonialism has helped Europe develop, but slowed down development in many other countries. Countries that went through industrialisation a while ago, have now develop further.

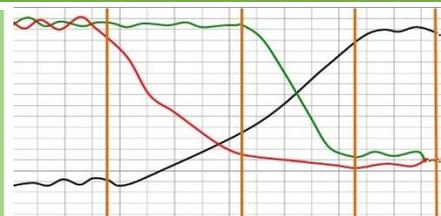
Consequences of Uneven Development

Levels of development are different in different countries. This uneven development has consequences for countries, especially in wealth, health and migration.

Wealth	People in more developed countries have higher incomes than less developed countries.
Health	Better healthcare means that people in more developed countries live longer than those in less developed countries.
Migration	If nearby countries have higher levels of development or are secure, people will move to seek better opportunities and standard of living.

The Demographic Transition Model

The demographic transition model (DTM) shows population change over time. It studies how birth rate and death rate affect the total population of a country.



STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5
High DR High BR Steady	BR Low Declining DR Very High	Rapidly falling DR Low BR High	Low DR Low BR Zero	Slowly Falling DR Low BR Negative
e.g. Tribes	e.g. Kenya	e.g. India	e.g. UK	e.g. Japan

Reducing the Global Development Gap

Microfinance Loans

This involves people in LICs receiving small loans from traditional banks.

- + Loans enable people to begin their own businesses
- Its not clear they can reduce poverty at a large scale.

Aid

This is given by one country to another as money or resources.

- + Improve literacy rates, building dams, improving agriculture.
- Can be wasted by corrupt governments or they can become too reliant on aid.

Fair trade

This is a movement where farmers get a fair price for the goods produced.

- + Paid fairly so they can develop schools & health centres.
- Only a tiny proportion of the extra money reaches producers.

Foreign-direct investment

This is when one country buys property or infrastructure in another country.

- + Leads to better access to finance, technology & expertise.
- Investment can come with strings attached that country's will need to comply with.

Debt Relief

This is when a country's debt is cancelled or interest rates are lowered.

- + Means more money can be spent on development.
- Locals might not always get a say. Some aid can be tied under condition from donor country.

Technology

Includes tools, machines and affordable equipment that improve quality of life.

- + Renewable energy is less expensive and polluting.
- Requires initial investment and skills in operating technology

CS: Reducing the Development Gap In Jamaica

Location and Background

Jamaica has become a popular tourist destination offering beautiful beaches, a warm sunny climate and rich cultural heritage. Jamaica enjoys good international air communications and is a hub for cruise ships.



Tourist economy

Tourism is the main source of employment in Jamaica. It provides jobs for 200 000 people either directly or indirectly. In 2014 tourism contributed 24% of Jamaica's GDP. Tourism has led to a high level of investment on the north coast where much of the country's tourism is centred.

Multiplier effect

- Jobs from tourism have meant more money has been spent in shops and other businesses.
- Government has invested in infrastructure to support tourism.

Development Problems

- Infrastructure improvements have not spread to the whole country
- Many people in Jamaica still live in poor quality housing and lack basic services such as healthcare.

Case Study: Economic Development in India

Location & Importance

South Asia, bordered by the Indian Ocean, with Tibet (China) to the north and Pakistan to the east. A NEE and the world second most populous country. India's service sector is the major source of economic growth, with its large English speaking population.



Influences upon India's development

Political

From 1858 -1947 India was ruled by the UK. Now has democratically elected government Part of the WTO and G20, the world's 20 biggest economies.

Social

India has a medium level of development. There are large inequalities in the country. Education is improving but adult literacy rate is still 75%. Wide range of religions and faiths. Average life expectancy is 68.5.

Cultural

India has rich and diverse culture. It has 22 official languages and is famous for its production of 'Bollywood' films.

Environment

It has a varied landscape e.g. Himalayas in the north, Thar Desert in the north west, and large areas of forest.

The role of TNCs

Unilever is an example TNC Unilever employs over 16,000 people in India and pays about 40% of their income to the Indian government

- Profits move to HICs.
- Over use of water have damaged environments and reduce local harvests.

Reasons why India is developing

Government investment in infrastructure projects such as transport and power. The government opened up India economy to foreign direct investment. Rapid growth of technology such as mobile and smart phones.

Environmental Impacts

Jharia in the eastern Indian state of Jharkhand where underground fires have burned for more than a century. Water pollution has become a major issue, especially during the monsoon rains.

Aid & Debt relief

+ A large amount of foreign aid received by India goes into social development areas like HIV/AIDS & education

Some aid fails to reach the people who need it due to corruption.

Effects of Economic Development

Growing twice as fast as China, with its young working population economic growth will continue in India.

Case Study: Economic Change in the UK

UK in the Wider World

The UK has one of the largest economies in the world. The UK has huge political, economic and cultural influences. The UK is highly regarded for its fairness and tolerance. The UK has global transport links i.e. Heathrow and the Eurostar.



Causes of Economic Change

De-industrialisation and the decline of the UK's industrial base. Globalisation has meant many industries have moved overseas, where labour costs are lower. Government investing in supporting vital businesses.

Towards Post-Industrial

The quaternary industry has increased, whilst secondary has decreased. Numbers in primary and tertiary industry has stayed the steady. Big increase in professional and technical jobs.

Developments of Science Parks

Science Parks are groups of scientific and technical knowledge based businesses on a single site.

- Access to transport routes.
- Highly educated workers.
- Staff benefit from attractive working conditions.
- Attracts clusters of related high-tech businesses.

CS: UK Car Industry

Every year the UK makes 1.5 million cars. These factories are owned by large TNCs. i.e. Nissan.

- 7% of energy used there factories is from wind energy.
- New cars are more energy efficient and lighter.
- Nissan produces electric and hybrid cars.

Change to a Rural Landscape – South Derbyshire and Outer Hebrides

Social

Rising house prices have caused tensions in villages. Villages are unpopulated during the day causing loss of identity. Resentment towards poor migrant communities.

Economic

Lack of affordable housing for local first time buyers. Sales of farmland has increased rural unemployment. Influx of poor migrants puts pressures on local services.

Improvements to transport

A £15 billion 'Road Improvement Strategy'. This will involve 10 new roads and 1,600 extra lanes. £50 billion HS2 railway to improve connections between key UK cities. £18 billion on Heathrow's controversial third runway. UK has many large ports for importing and exporting goods.

UK North/South Divide

- Wages are lower in the North.
- Health is better in the South.
- Education is worse in the North.
+ The government is aiming to support a Northern Powerhouse project to resolve regional differences.
+ More devolving of powers to disadvantaged regions.

Introduction to India and its importance	India: political, social, cultural and environmental context	India is rapidly developing
<ul style="list-style-type: none"> India is a rapidly developing NEE. It has the second largest population in the world (around 1.3 billion) India has the biggest economy in South Asia.. It has established trade links with south east Asia and the Middle East. India is increasingly important globally – it exports services (IT support) and manufactured goods (e.g. medicines) across the world and it's a member of the World Trade Organisation and the G20 (a group of 20 of the world's biggest economies) 	<p>Political – India was a British colony until 1947, but now it has a democratically elected government</p> <p>Social – India has a medium level of development. There are large inequalities in the country. Education is improving but adult literacy rate is still 75%.</p> <p>Cultural – India has rich and diverse culture. It has 22 official languages and is famous for its production of 'Bollywood' films.</p> <p>Environmental – it has a varied landscape e.g. Himalayas in the north, Thar Desert in the north west, and large areas of forest.</p>	<p>India is playing a larger role in regional and global politics. In recent years the Indian government has improved relations with its immediate neighbours and global trading partners. International trade is also growing:</p> <ol style="list-style-type: none"> India is reducing barriers to trade and encouraging foreign direct investment. Trade with foreign businesses, particularly those who get companies in India's large service sector to do office jobs for them, is also increasing. India is also working with its neighbours to build the TAPI pipeline to carry natural gas from Turkmenistan, through Afghanistan and Pakistan to India.
India's industrial structure is changing	Environmental impacts of economic development in India:	Environmental improvements include:
<ul style="list-style-type: none"> Primary industry employs 42% of the population, but only accounts for 15% of the GDP. Secondary industry has grown rapidly. In 2018 it employed 24% of the workforce. This has stimulated economic growth by providing people with reliable jobs and has led to a positive cycle as workers spend their income in local shops and other businesses which attracts more industry to the area. Tertiary and quaternary industries have become much larger, employing 34% of the workforce. Lots of growth is due to growth in IT firms (call centres). Quaternary industries contribute the most to India's GDP – 62%. 	<ul style="list-style-type: none"> Energy consumption has increased. Fossil fuels like coal and oil are the most readily available, but release lots of pollution and GHGs. The capital Delhi, has the worst air pollution in the world. Demand for resources can lead to the destruction of habitats, e.g. coal mining in Maharashtra has damaged the habitats of Bengal tigers. 	<ul style="list-style-type: none"> Increased income from economic development means people can afford to protect the environment. For example, since 1990, India's forest cover has stopped decreasing and started to grow. India has improved its use of renewable energy, particularly solar power
Transnational corporation in India: Unilever	Advantages of Unilever in India	Disadvantages of Unilever in India
<ul style="list-style-type: none"> One of the world's biggest food and consumer goods manufacturers. Headquarters in the UK/Netherlands. Hindustan Unilever Limited is its Indian division. TNCs can help economic development by increasing the amount of <u>manufacturing industry</u>. They can bring <u>great benefits</u> to the countries they operate in, but they also have <u>disadvantages</u>. <p style="text-align: center;">Economic Development in India</p>	<ul style="list-style-type: none"> TNCs provide employment – Unilever employs over 16,000 people in India. TNCs have to pay tax of about 40% of their income to the Indian government. Hindustan Unilever has annual sales of over \$5 billion, so its taxes make a significant contribution to the government's income. Some TNCs run programs to increase development in India. E.g. Unilever's Project Shakti helps women in rural areas become entrepreneurs by providing loans and products for them to sell. There are now about 75,000 women in the scheme. Unilever has also worked with charities to improve sanitation for over 140 million people in India. 	<ul style="list-style-type: none"> TNCs may close operations in LICs and NEEs, causing job losses. TNCs may also decide to relocate factories to a different area of the country to take advantage of local government incentives (e.g. tax breaks), so jobs can be unreliable. TNCs can cause environmental problems, e.g. factories can contribute to air and water pollution or deplete water supplies. Unilever takes advantage of weaker environmental laws. There were leaks of mercury from a Unilever factory in Kodaikanal onto a waste dump (where people live).

Resource Challenges

Resources are things that humans require for life or to make our lives easier. Humans are becoming increasingly dependent on exploiting these resources, and as a result they are in high demand.

Significance of Water

Resources such as food, energy and water are what is needed for basic human development.

FOOD 	WATER 	ENERGY 
Without enough nutritious food, people can become malnourished . This can make them ill. This can prevent people working or receiving education.	People need a supply of clean and safe water for drinking, cooking and washing. Water is also needed for food, clothes and other products.	A good supply of energy is needed for a basic standard of living. People need light and heat for cooking or to stay warm. It is also needed for industry.

Demand outstripping supply

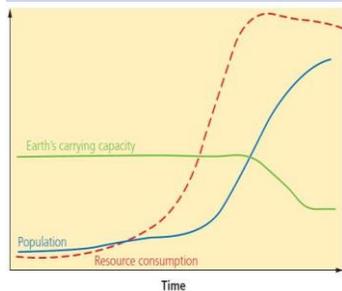
The demand for resources like food, water and energy is rising so quickly that supply cannot always keep up. Importantly, access to these resources vary dramatically in different locations

1. Population Growth

- Currently the global population is **over 8 billion**.
- Global population has risen **exponentially** this century.
- Global population is expected to reach **9 billion by 2050**.
- With more people, the **demand** for food, water, energy, jobs and space **will increase**.

2. Economic Development

- As LICs and NEEs develop further, they require **more energy** for industry.
- LICs and NEEs want similar lifestyles to HICs, therefore they will need to **consume more resources**.
- Development means **more water is required** for food production as diets improve.



Resource Reliance Graph

Consumption – The act of using up resources or purchasing goods and produce.
Carry Capacity – A maximum number of species that can be supported.

Resource consumption exceeds Earth's ability to provide! 

3. Changing Technology and Employment

- The demand for resources has driven the **need for new technology** to reach or gain more resources.
- More people in the **secondary and tertiary industry** has increased the **demand for resources** required for electronics and robotics.

Food in the UK

Growing Demand

- The UK imports about 40% of its food. This increases people's **carbon footprint**.
- There is growing demand for greater choice of **exotic foods** needed all year round.
- Foods from abroad are more affordable.
- Many food types are unsuitable to be grown in the UK.

Impact of Demand

Foods can travel **long distances (food miles)**. Importing food adds to our carbon footprint.
 + Supports workers with an income
 + Supports families in LICs.
 + Taxes from farmers' incomes contribute to local services.
 - Less land for locals to grow their own food.
 - Farmers exposed to chemicals.

Agribusiness

Farming is being treated like a **large industrial business**. This is increasing food production.
 + Intensive farming maximises the amount of food produced.
 + Using machinery which increases the farms efficiency.
 - Only employs a small number of workers.
 - Chemicals used on farms damages the habitats and wildlife.

Sustainable Foods

Organic foods that have little impact on the environment and are healthier have been rising. Local food sourcing is also rising in popularity.
 • Reduces emissions by only eating food from the UK.
 • Buying locally sourced food supports local shops and farms.
 • A third of people **grow their own food**.

Unit 2c



The Challenge of Resource Management

Energy in the UK

Growing Demand

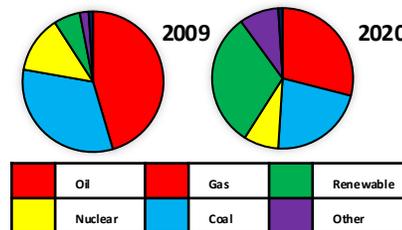
The UK consumes **less energy** compared to the 1970s due to energy conservation and the **decline of industry**.

Energy Mix

The majority of UK's energy mix comes from **fossil fuels**. By 2030, the UK is expected to have a power mix with very high shares of wind and solar. These renewable sources do not contribute to **climate change**.

Changes in Energy Mix

- 75% of the UK's oil and gas has been used up.
- Coal consumption has declined.
- UK has become too dependent on imported energy.



Water in the UK

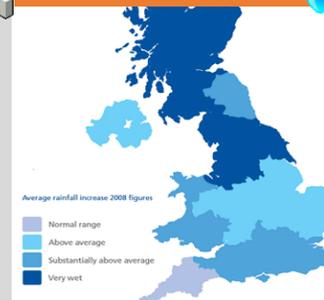
Growing Demand

The average water used per household has risen by **70%**. There is growing demand due to:
 • A growing UK population.
 • Water-intensive appliances.
 • Showers and baths taken.
 • Industrial and leisure use.
 • Watering greenhouses.

Pollution and Quality

- Cause and effects include:
- Chemical run-off from farmland can destroy habitats and kills animals.
 - Oil from boats and ships poisons wildlife.
 - Untreated waste from industries creates unsafe drinking water.
 - Sewage containing bacteria spreads infectious diseases.

Water stress in the UK



Management

UK has **strict laws** that limits the amount of discharge from factories and farms. **Education campaigns** to inform what can be disposed of safely. **Waste water treatment plants** remove dangerous elements to then be used for safe drinking. Pollution traps catch and filter pollutants.

Water Transfer

Water transfer involves moving water through pipes from areas of surplus (Wales) to areas of deficit (London).
Opposition includes:

- Effects on **land and wildlife**.
- High maintenance **costs**.
- The **amount of energy** required to move water over long distances.

Energy in the UK (continued)

Significance of Renewables

+ The UK government is investing more into low carbon alternatives.
 + UK government aims to meet targets for reducing emissions.
 + Renewable sources include wind, solar and tidal energy.
 - Although infinite, renewables are still expensive to install.
 - Shale gas deposits may be exploited in the near future

Exploitation

Nuclear

New plants provide job opportunities.
 Problems with safety and possible harm to wildlife.
 Nuclear plants are expensive.

Wind Farm

Locals have low energy bills.
 Reduces carbon footprint.
 Construction cost is high.
 Visual impacts on landscape.
 Noise from wind turbines.

Your chosen option is Option 2: Water

Option 2: WATER

Water security is when people have good access to enough clean water to sustain well-being and good health. Water insecurity is when areas are without sufficient water supplies. Water Stress is when less than 1700m³ is available per person

Human	Physical
<ul style="list-style-type: none"> Pollution caused from human and industrial waste being dumped into peoples water sources. Poverty prevents low income families affording water. Limited infrastructure such as a lack of water pipes and sewers. Over-abstraction is when more water is taken than is replaced. 	<ul style="list-style-type: none"> Climate needs to provide enough rainfall to feed lakes and rivers. Droughts affect supply of water. Geology can affect accessibility to water. Permeable rock means sourcing water from difficult aquifers, whereas impermeable allows water to run-off into easily collected basins.

Impact of Water Insecurity

Food production	Industrial output
The less water available for irrigating crops the less food that will be produced. This could lead to starvation.	Manufacturing industries depend heavily on water. A severe lack of water can impact economic output.
Disease and Water Pollution	Water conflict
Inadequate sanitation systems pollutes drinking water causing diseases such as cholera and typhoid.	Water sources that cross national borders can create tensions and even war between countries.

Increasing Water Supply

C.S. Lesotho Highland Water Project

Lesotho is a highland country dependent on South Africa. Lesotho has water surplus due to high rainfall.

Advantages

- Provides 75% of Lesotho's GDP.
- Provides water to areas of drought in South Africa.

Disadvantages

- Dams displaced 30,000 people.
- Destruction to key ecosystems.
- 40% lost through pipe leakages.

Sustainable Water Supply

C.S. NEE - The Wakel River Basin

A project in India that aims to improve water use by encouraging greater use of rain water harvesting techniques.

How does the project work?

- Provides 'taankas' that store water underground.
- Small dams called 'johed' interrupt water flow and encourages infiltration.
- Villages take turns to irrigate their fields so water is not overused.
- Maintained by farmers so it is entirely sustainable.
- Greater education for awareness.

Ensures water supplies don't cause damage to the environment whilst also supporting the local economy.

Water conservation - Aims to reduce the amount of water wasted.

Groundwater Management - Involves the monitoring of extracting groundwater. Laws can be introduced.

Recycling and 'Grey' Water - Means taking water that has already been used and using it again rather than returning it to a river or the sea. This includes water taken from bathrooms and washing machines.